UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 05521

CSAH NO. 2

OVER THE

MISSISSIPPI RIVER

DISTRICT 3 - BENTON COUNTY

PREPARED FOR THE

MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

JOB NO. 3512 (CEI 80)

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 05521, Piers 1, 2, and 3, were found to be in very good to good condition with no defects of structural significance observed. A band of minor concrete scaling was observed around all piers at the waterline. The channel bottom around the substructure units consisted of firm material that was well established; however, minor scour depressions have developed at the upstream noses of Piers 1 and 2 since the previous inspection.

INSPECTION FINDINGS:

(A) A band of minor scaling was observed from 4 feet above to 1 foot below the waterline with typical penetrations of 1/8 inch and a maximum penetration of 1/4 inch.

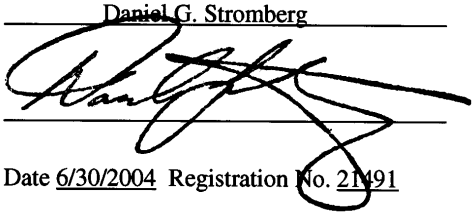
(B) A 4-foot-radius by 1.5-foot-deep sour depression was observed at the upstream end of Pier 1, and a 2-foot-radius by 6-inch-deep scour depression with a minor accumulation of timber debris was observed at the upstream end of Pier 2.

RECOMMENDATIONS:

(A) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

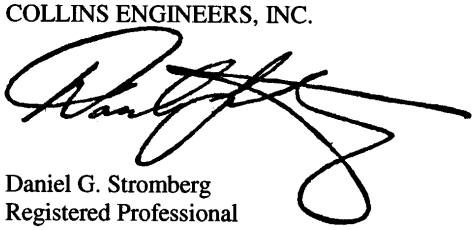
Daniel G. Stromberg



Date 6/30/2004 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.



Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 05521

Feature Crossed: The Mississippi River

Feature Carried: CSAH No. 2

Location: District 3 - Benton County

Bridge Description: The bridge superstructure consists of four spans of multiple welded plate girders supporting a reinforced concrete deck. The superstructure is supported by three reinforced concrete piers and two reinforced concrete abutments, all of which are founded on timber piles. The piers are numbered 1 through 3 starting from the west end of the bridge.

2. INSPECTION DATA

Professional Engineer/Team Leader: Shirley M. Walker, P.E.

Dive Team: Michelle D. Koerbel, Clayton G. Brookins

Date: September 27, 2002

Weather Conditions: Sunny, "60EF

Underwater Visibility: "3 Feet

Waterway Velocity: "1 f.p.s.

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1, 2, and 3.

General Shape: The piers consist of a rectangular reinforced concrete shaft with rounded ends supporting a rectangular reinforced concrete hammerhead pier cap. Each pier shaft is supported on a rectangular footing founded on timber piles.

Maximum Water Depth at Substructure Inspected: Approximately 12 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the parapet wall at the south end of Pier 1.

Water Surface: The waterline was approximately 26.9 feet below reference. Waterline Elevation = 1014.9.

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 8

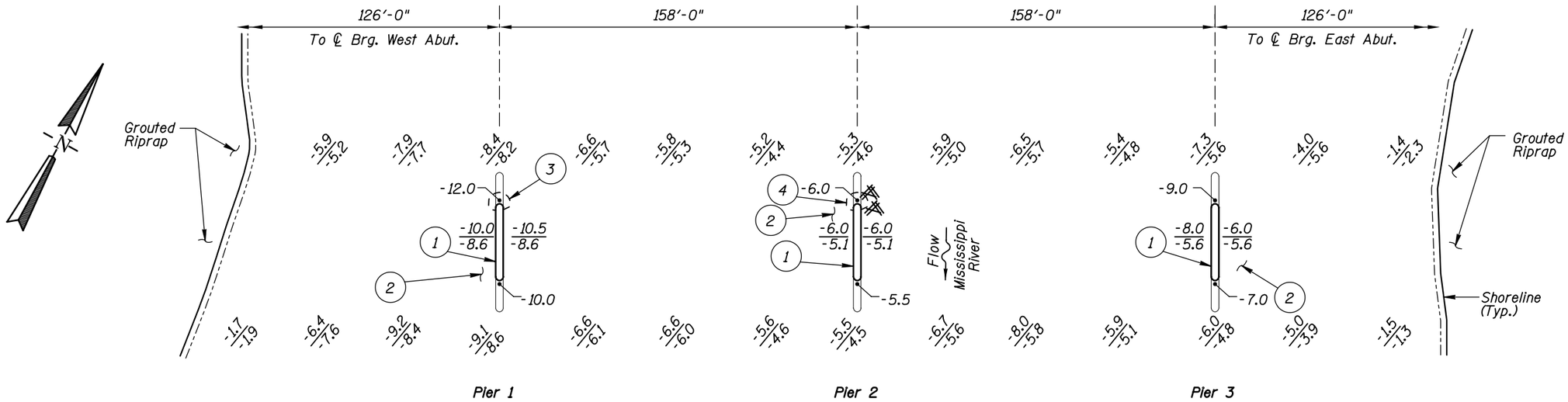
Item 61: Channel and Channel Protection: Code 7

Item 92B: Underwater Inspection: Code B/09/02

Item 113: Scour Critical Bridges: Code J/91

Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

_____Yes __X__ No



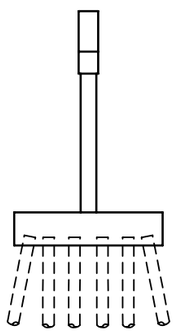
SOUNDING PLAN

INSPECTION NOTES:

1. A band of minor scaling was observed from 4 feet above to 1 foot below the waterline with typical penetrations of 1/8 inch and a maximum penetration of 1/4 inch.
2. The channel bottom consisted of sandy gravel and up to 5-inch-diameter cobbles with a maximum probe rod penetration of 4 inches.
3. A 4-foot-radius, 1.5-foot-deep sour pocket was observed at the upstream end of Pier 1.
4. A 2-foot-radius, 6-inch-deep scour pocket with a minor accumulation of timber debris was observed at the upstream end of Pier 2.

GENERAL NOTES:

1. Piers 1, 2, and 3 were inspected underwater.
2. At the time of inspection on September 27, 2002, the waterline was located approximately 26.9 feet below the top of the parapet at the downstream end of Pier 1. This corresponds to a waterline elevation of 1014.9 based on the previous report dated September 4, 1997.
3. Soundings indicate the water depth at the time of inspection and are measured in feet.
4. Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure units.



TYPICAL END VIEW OF PIERS

Legend

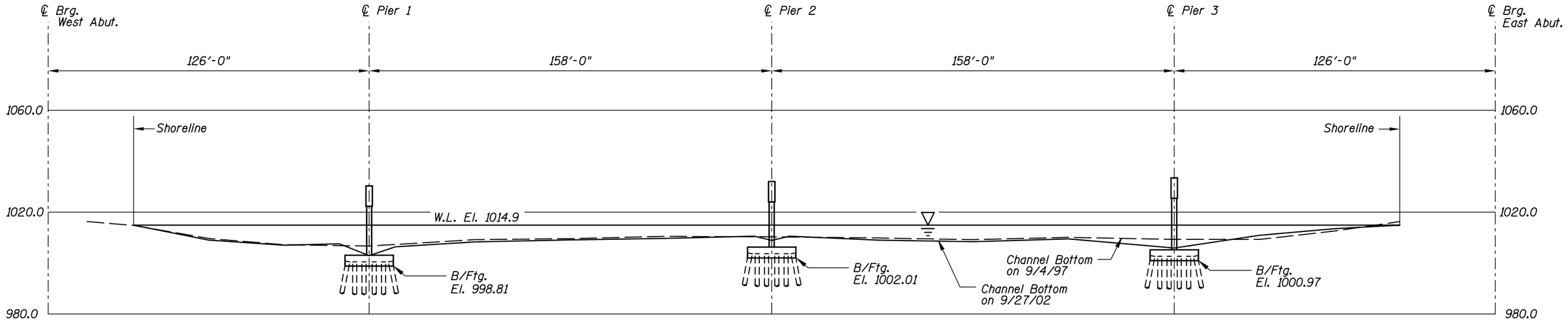
-1.7 / -1.9	Sounding Depth from Waterline (9/27/02) / (9/4/97)
	Timber Debris

MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

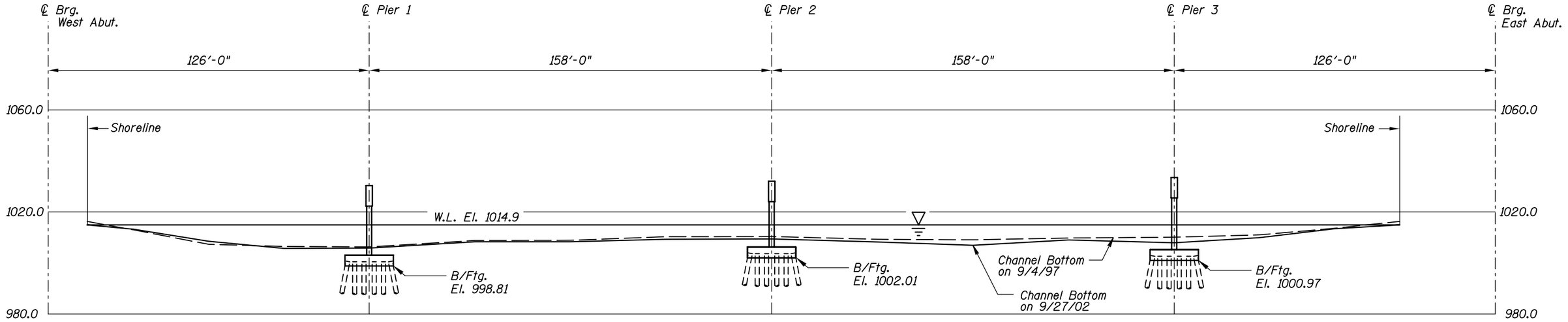
STRUCTURE NO. 05521
OVER THE MISSISSIPPI RIVER
DISTRICT 3, BENTON COUNTY

INSPECTION AND SOUNDING PLAN

Drawn By: PRH	COLLINS ENGINEERS, INC.	Date: SEPT. 2002
Checked By: MDK	300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300	Scale: NTS
Code: 35120080		Figure No.: 1



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:

Refer to Figure 1 for General Notes.

MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

STRUCTURE NO. 05521
OVER THE MISSISSIPPI RIVER
DISTRICT 3, BENTON COUNTY

UPSTREAM AND DOWNSTREAM FASCIA PROFILES

Drawn By: PRH	COLLINS ENGINEERS, INC.	Date: SEPT. 2002
Checked By: MDK	300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300	Scale: 1"=40'
Code: 35120080		Figure No.: 2

Photograph 1. Overall View of the Structure, Looking North.

Photograph 2. View of Pier 1, Looking North.

Photograph 3. View of Pier 2, Looking South.

Photograph 4. View of Pier 3, Looking South.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES
DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc. DATE: September 27, 2002

ON-SITE TEAM LEADER: Shirley M. Walker, P.E.

BRIDGE NO: 05521 WEATHER: Sunny, "60EF

WATERWAY CROSSED: The Mississippi River

DIVING OPERATION: X SCUBA SURFACE SUPPLIED AIR

OTHER

PERSONNEL: Michelle D. Koerbel, Clayton G. Brookins

EQUIPMENT: Scuba, Probe Rod, Lead Line, Sounding Pole, U/W Light, Scraper, Camera

TIME IN WATER: 4:30 p.m.

TIME OUT OF WATER: 5:30 p.m.

WATERWAY DATA: VELOCITY "1 f.p.s.

VISIBILITY "3 feet

DEPTH 12 feet maximum at Pier 1

ELEMENTS INSPECTED: Piers 1, 2, and 3

REMARKS: Overall, the concrete of the piers was in good condition with only a band of minor scaling from 4 feet above to 1 foot below the waterline. Minor scour pockets were observed at the upstream noses of Piers 1 and 2 with some minor timber drift at Pier 2 also. It was noted that the slopes at the abutments were well protected with grouted riprap.

FURTHER ACTION NEEDED: _____ YES ____X___ NO

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 05521
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Shirley M. Walker, P.E.
WATERWAY CROSSED The Mississippi River

INSPECTION DATE September 27, 2002

NOTE: USE ALL APPLICABLE CONDITION DEFINITIONS AS DEFINED IN THE MINNESOTA RECORDING AND CODING GUIDE INCLUDING GENERAL, SUBSTRUCTURE, CHANNEL AND PROTECTION, AND CULVERTS AND WALL DEFINITIONS TO COMPLETE THIS FORM.

CONDITION RATING

			SUBSTRUCTURE						CHANNEL					GENERAL					
UNIT REFERENCE NO.		MAXIMUM DEPTH OF WATER	PILING	COLUMNS, SHAFTS, OR FACES*	FOOTINGS	DISPLACEMENT	OTHER	OVERALL SUBSTRUCTURE CONDITION CODE*	SCOUR	EMBANKMENT EROSION	EMBANKMENT PROTECTION	OTHER (DRIFT/DEBRIS)	OVERALL CHANNEL & PROTECTION CONDITION	CONCRETE	STEEL	TIMBER	LOSS OF SECTION	PREVIOUS REPAIR OR MAINTENANCE	OTHER
	UNIT DESCRIPTION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Pier 1	12.0’	N	8	N	9	N	8	7	N	N	N	7	8	N	N	N	N	N
	Pier 2	6.0’	N	8	N	9	N	8	7	N	N	7	7	8	N	N	N	N	N
	Pier 3	9.0’	N	8	N	9	N	8	8	N	N	N	7	8	N	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the concrete of the piers was in good condition with only a band of minor scaling from 4 feet above to 1 foot below the waterline. Minor scour pockets were observed at the upstream noses of Piers 1 and 2 with some miner timber drift at Pier 2 also. It was noted that the slopes at the abutments were well protected with grouted riprap.

NOTES: ATTACH SKETCHES AS NEEDED, IDENTIFY REMARK BY REFERRING TO UNIT REFERENCE NO. AND REMARK NO.
USE GENERAL SECTION TO IDENTIFY OVERALL PRESENCE OF SPALLS, CRACKS, CORROSION, ETC.